HIGH SCHOOL AND UNIVERSITY
MATRICULATION EXAMINATIONS BOARD.

DEPARTMENTAL EXAMINATIONS, 1929.

PHYSICS 2.

Time — Three hours.

Values.

4 **1.** (*a*) A referee dropped a puck weighing $\frac{1}{2}$ lb. a distance of 4 ft. What was its velocity and its momentum at the instant it struck the ice?

6 (*b*) Two hockey players simultaneously struck the puck, the one with a blow that would have sent it forward with a velocity of 40 ft. per second, and the other with a blow that would have sent it to the right with a velocity of 30 ft. per second. Find, by using a diagram, the direction and the magnitude of the resultant velocity.

5 (*c*) If the puck travelled for 8 seconds through a distance of 200 feet before coming to rest, what was its acceleration?

2. *Either*

3 (*a*) Define the moment of a force. Give a practical example of its application.

6 (*b*) A ladder, 14 ft. long, whose mass is 50 lbs., rests with one end against the foot of a vertical wall; from a point 4 feet from its upper end a cord which is horizontal runs to a point 6 feet above the foot of the wall. Find the tension of the cord and the reaction at the lower end of the ladder.

Or

3 (*a*) Define a "couple" and give a practical illustration of its use.

6 (*b*) Describe the action of the selective type of automobile transmission, giving three speeds forward and one in reverse.

URRICULUM
B
054
2
419
929
xam.4
URR HIST

Values.

6 **3.** (*a*) Distinguish the terms energy, force, and power as used in mechanics.

6 (*b*) Develop the formula $K.\ E. = \frac{M\ V^2}{2}$

6 (*c*) A shaft whose horizontal section is a rectangle 10 ft. by 8 ft., is to be sunk 100 feet into the earth. If the average weight of the soil is 150 lbs. per cu. ft., find the work done in bringing the soil to the surface.

7 **4.** (*a*) Using a diagram, describe the differential wheel and axle. Find its mechanical advantage.

2 (*b*) For what purposes are pulleys used?

5 (*c*) A ton of hay is lifted from a wagon by means of a system of six pulleys. Draw a diagram to illustrate the arrangement of the pulleys. Calculate the force required to do the work.

6 **5.** (*a*) What is Pascal's Principle? Briefly outline *two* experiments to demonstrate the accuracy of the Principle.

6 *Either* (*b*) A potato (specific gravity 1.22) just floats fully submerged in a mixture of water and brine. Find the proportions of water and brine (1) by weight (2) by volume. (Specific gravity of brine is 1.4).

6 (*a*) Describe, using a diagram, a method for pumping water which is 100 feet below the surface of the earth.

Or

6 (*b*) Using a diagram, make clear the operation of a common siphon.

4 **6.** (*a*) An S-shaped piece of paper has a drop of amyl alcohol placed on each end, after which the paper is floated on the surface of water.

Describe and explain what takes place.

3 (*b*) Explain why a drop of water on a wooden table flattens out while a drop of mercury assumes a globular shape.

3 (*c*) Why does water rise in a capillary tube?

Values.

6 **7.** (*a*) Describe an experiment to illustrate that the velocity of a liquid flowing through a pipe is inversely proportional to the area of the cross section of the pipe.

5 (*b*) Describe the form and the operation of the common atomizer.

6 **8.** (*a*) Define: coulomb, joule, watt.

5 (*b*) Find the horse-power capacity of a dynamo capable of producing 50 amperes of current at a voltage of 2200.

100

Ex libris
Universitatis
Albertaensis

QUAECUMQUE VERA